

REMARKS

Reconsideration of the above-identified patent application in view of the amendments above and the remarks following is respectfully requested.

Claims 1, 4-9, 11, 12, 14, 16-31, 34-39, 41, 42, 44 and 46-59 are in this case. Claims 20-30 and 50-59 were withdrawn by the Examiner from consideration as drawn to a non-elected invention. Claims 1, 4-9, 11, 12, 14, 16-19, 31, 34-39, 41, 42, 4 and 46-49 have been rejected under § 112, second paragraph. Claims 1, 4-9, 11, 12, 14, 16-19, 31, 34-39, 41, 42, 4 and 46-49 have been rejected under § 103(a). Independent claims 1 and 31 have been amended.

Specifically, claims 1 and 31 have been amended to clarify that the gather engine is a hardware gather engine and that the commonly shared data flow path is from the system memory to the network output port (claim 1) or to the network (claim 31). Support for the gather engine being a hardware gather engine is found in the patent application as filed at least on page 4 lines 19-23,

...a HCA is configured to handle both requester and responder communications flows using common hardware resources, rather than maintaining separate hardware paths for these functions as in devices known in the art. (emphasis added)

followed by page 5 lines 8-26:

By the same token, in generating RDMA write and send requests to a remote responder, as in preparing RDMA read responses to send to a remote requester, the HCA “gathers” data from the local memory and sends it in packets to a remote destination. Client processes on the local host generate write and send requests by submitting WRs to the HCA, so that WQEs are placed in the appropriate HCA queues. A gather engine services the WQEs by reading the specified data from the local memory and inserting the data in request packets for transmission. To conform to this model, when the HCA receives RDMA read requests from a remote requester, it similarly generates a list of quasi-WQEs in local memory, which identify the data to be sent to the requester. These quasi-WQEs differ semantically from the WQEs generated by the local host, but they are handled by the HCA in the same way. The quasi-WQEs are serviced

by the same gather engine that is responsible for servicing the write and send requests. (emphasis added)

Support for the common data flow path being from the system memory to the network output port or to the network is found in the patent application as filed at least in Figure 2 and the accompanying text on page 20. The preferred example of a gather engine that is illustrated in Figure 2 includes send data engine 66 that (page 20 lines 12-15)

...gathers the data to be sent from the locations in memory 38 specified by the WQEs...and places the data in output packets for transmission over network 26.

In addition, the last “wherein” clause of claim 31, being redundant, has been deleted.

§ 112, Second Paragraph Rejections

The Examiner has rejected claims 1, 4-9, 11, 12, 14, 16-19, 31, 34-39, 41, 42, 44 and 46-49 under § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Examiner has pointed out, referring specifically to claim 1, that it is not clear between which components of the network interface adapter the common data flow path exists, whether the path corresponds to a logical path or connection or link between the adapter and memory or between the adapter and the host processor interface etc.

Applicant submits that the present amendments to independent claims 1 and 31, that clarify that the gather engine is a hardware gather engine and that the commonly shared data flow path is from the system memory to the network via the network output port, completely overcome the Examiner’s rejections on § 112, second paragraph grounds.

§ 103(a) Rejections – Pettey et al. ‘712 in view of Pettey ‘544

The Examiner has rejected claims 1, 4, 5, 7, 9, 12, 14, 16-19, 31, 34-38, 42, 44, 46-49 and 64-66 under § 103(a) as being unpatentable over Pettey et al., US Patent No. 6,594,712 (henceforth, “Pettey et al. ‘712”) in view of Pettey, US Patent Application Publication No. 2003/0014544 (henceforth, “Pettey ‘544”). The Examiner’s rejection is respectfully traversed.

In order for independent claims 1 and 31 to be unpatentable over Pettey et al. ‘712 in view of Pettey ‘544, these references must teach or suggest every recited limitation. As the Board of Patent Appeal and Interferences has confirmed in *In re Wada and Murphy*, Appeal 2007-3733,

When determining whether a claim is obvious, an examiner must make “a searching comparison of the claimed invention – including all its limitations – within the teaching of the prior art”. *In re Orchiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, “Obviousness requires a suggestion of all limitations in a claim.” *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (citing *In re Royka*, 490 F.2d 981, 985 (CCPA 1974)).

In the present case, neither Pettey et al. ‘712 nor Pettey ‘544 teach, hint or suggest a gather engine that gathers both write data and read data from a system memory for inclusion in outgoing packets via a commonly shared data flow path. The Examiner himself has acknowledged that Pettey et al. ‘712 lacks such a teaching, insofar as the Examiner has cited only Pettey ‘544 as teaching a gather engine. Specifically, the Examiner has cited Figure 8 of Pettey ‘544 as teaching a gather engine. Figure 8 of Pettey ‘544 does not teach a gather engine as such, but only the *logical* structure of host channel adapter **850**. As best understood, host channel adapter **850** is configured according to the prior art architecture described in the paragraph starting on page 3 line 22 of the specification of the above-identified patent application: a dual pipeline architecture with independent microprocessors and DMA

engines for separate receive and transmit data paths. By contrast, the gather engine recited in independent claims 1 and 31 is a component of “common hardware resources” (page 4 line 21) that handles “both requester and responder communication flows” (page 4 lines 20-21). Specifically, the general operation of the gather engine is described in the above citation from page 5 lines 8-26 of the specification as filed.

These arguments were presented by Applicant in response to the Office Action mailed March 17, 2010. The Examiner has responded to these arguments, on page 3 of the present Office Action, as follows:

The recited limitation...fails to teach and/or suggest how the commonly shared data flow path is implemented or achieved.

In other words, it is unclear between which components of the HCA the common data flow path exists, whether the path corresponds to logical path or connection or link between HCA and memory or HCA and host processor interface etc.

At best, the recitation suggests using the host interface for gathering the write data and read data from the memory.

Applicant submits that claims 1 and 31 as now amended recite positively that the gather engine is physical hardware, and not merely a logical construct, that provides a commonly shared data flow path from one specific physical location (the system memory) to another specific physical location (the network via the network output port). In other words, the present amendments to claims 1 and 31 completely overcome the Examiner’s rejection of these claims on § 103(a) grounds.

With independent claims 1 and 31 allowable in their present form it follows that claims 4, 5, 7, 9, 12, 14, 16-19, 34-38, 42, 44, 46-49 and 64-66 that depend therefrom also are allowable.

§ 103(a) Rejections – Pettey et al. '712 in view of Pettey '544 and Gasbarro et al.

'004

The Examiner has rejected claims 6, 8, 11, 39 and 41 under § 103(a) as being unpatentable over Pettey et al. '712 in view of Pettey '544 and Gasbarro et al, US Patent No. 6,948,004. The Examiner's rejection is respectfully traversed.

It is demonstrated above that independent claims 1 and 31 are allowable in their present form. It follows that claims 6, 8, 11, 39 and 41 that depend therefrom also are allowable.

In view of the above amendments and remarks it is respectfully submitted that independent claims 1 and 31, and hence dependent claims 4-9, 11, 12, 14, 16-19, 34-39, 41, 42, 44 and 46-49 are in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,



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